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WORTHINGTON
CYLINDERS

A Worthington Industries Company

2003-11-19

Associate Administrator
Hazardous Materials Safety, Research
and Special Programs Administration
U.S. Department of Transportation
400, 7th Street, SW
Washington, D.C. 20590-001
USA.

Document: DOT_Application_19-11-2003

RSFA-2004-7550-1

Attention: Exemptions, DHM-31

Enclosed, in triplicate, is an application for exemption from the Hazardous Materials Regulations which would permit the production and use of high strength, portable steel cylinders made in accordance with the International Standard ISO9809-2, approved by the United Nations Recommendations on the Transport of Dangerous Goods.

The applicant is:

Worthington Cylinders GmbH
Beim Herrenhaus 1
A-3291 Kienberg b. Gaming
Austria

Phone No.: ..43-7485-606-547
e-mail: gekoenig@wthg.at

The applicant is not a resident of the United States and the designated agent is given below in accordance with 49 CFR 107.7.

Mr. Steven Gentry
Worthington Cylinders Corporation
1085 Dearborn Drive
P.O. Box 391
COLUMBUS OHIO 43085
USA 1085

Phone No.: 0614 438 3057
e-mail: stgentry@worthingtonindustries.com

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MAIL ROOM
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WORTHINGTON
CYLINDERS
A Worthington Industries Company

February 27, 2004

United States Department of Transportation
R. Ryan Posten - Exemptions Program Officer
DHM-31 -- Exemptions
400 7th St., S.W.
Washington, DC 20590-0001

Dear Mr. Posten:

RSFA-2004-17550-1

I have received a copy of an application for exemption that our manufacturing facility in Austria filed with your Department. The "post-it" notes on the application indicates that I need to confirm in writing that I am the United States designated agent for this manufacturing facility.

This letter is to serve as confirmation that I am the designated United States Agent for Worthington Cylinder - Austria.

Steven T. Gentry
Regulatory Affairs Manager
Worthington Cylinder Corporation
1085 Dearborn Drive
Columbus, Ohio 43085

Telephone: 614-438-3057
Fax: 614-840-4830
e-mail: stgentry@worthingtonindustries.com

I understand that the Engineering Group of DOT is complete with their review of the exemption application and request processing of the request as soon as possible.

Thank you for your consideration in this matter.

Sincerely:

Steven T. Gentry
Regulatory Affairs Manager
Worthington Cylinder Corporation

../2

2003-11-19


WORTHINGTON
CYLINDERS
A Worthington Industries Company

The manufacture of the cylinders will occur at:

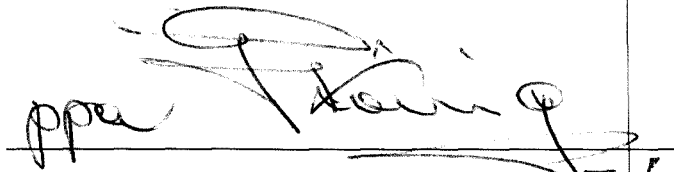
Worthington Cylinders GmbH
Beim Herrenhaus 1
A-3291 Kienberg b. Gaming
Austria


Contact person will be: Mr. Gerhard König

This application is justified on the basis that the Compressed Gas Association (USA) has participated in the drafting of standard ISO9809-2 and support approval thereof as a safe specification for use world wide. Furthermore, cylinders resulting in the same design have been authorized and used within the European Union (18 countries) for over 15 years with several million cylinders in use without a safety incident. Also this standard has been approved and authorized in the United Nations Model Recommendations to become effective in year 2003.

The international standards Organization (ISO) Technical Committee 58 assigned a Working Group (WG-14) to develop manufacturing controls to guarantee the safety of steel, high pressure gas cylinders designed to higher tensile strength. Extensive testing was performed in Europe, Japan and the United States to develop appropriate safety controls for cylinders constructed to ISO 9809-2. This standard assures a level of safety equal to DOT-3AA specifications.

Respectfully submitted,


ppa


WORTHINGTON
CYLINDERS GmbH
A-3291 Kienberg b. Gaming

PROPOSED DRAFT EXEMPTION
DOT-E XXXX
(first Edition)

1. GRANTEE. Worthington Cylinders GmbH.; Beim Herrenhaus;
A-3291 Kienberg-Gaming; Austria
2. PURPOSE AND LIMITATION. This exemption authorizes the Grantor to manufacture, mark, and sell the cylinders described in paragraph 7 for use in the transportation of certain flammable and nonflammable gases described in paragraph 6 below in commerce subject to the requirements specified herein. This exemption provides no relief from any regulations other than as specifically stated.
3. REGULATORY SYSTEM AFFECTED. 49 CFR Parts 106, 107 and 171-180.
4. REGULATIONS FROM WHICH EXEMPTED. 49 CFR Section 173.34 (a) (1), and 173.301 (h), and 173.302 (a) (1).
5. BASIS. This exemption is based on the application of Worthington Cylinders GmbH. dated 19-11-2003 submitted in accordance with 49 CFR 107.105.
6. HAZARDOUS MATERIALS (49 CFR 172.101).

Hazardous materials descriptions proper shipping name	Hazard Class / Division	Identi- fication Number	Packing Group
The various flammable and non-flammable gases authorized in 49 CFR 173.302 (a) (1) except hydrogen, carbon monoxide and gases having any free hydrogen or sulphides.	as appro- priate	as appro- priate	n/a

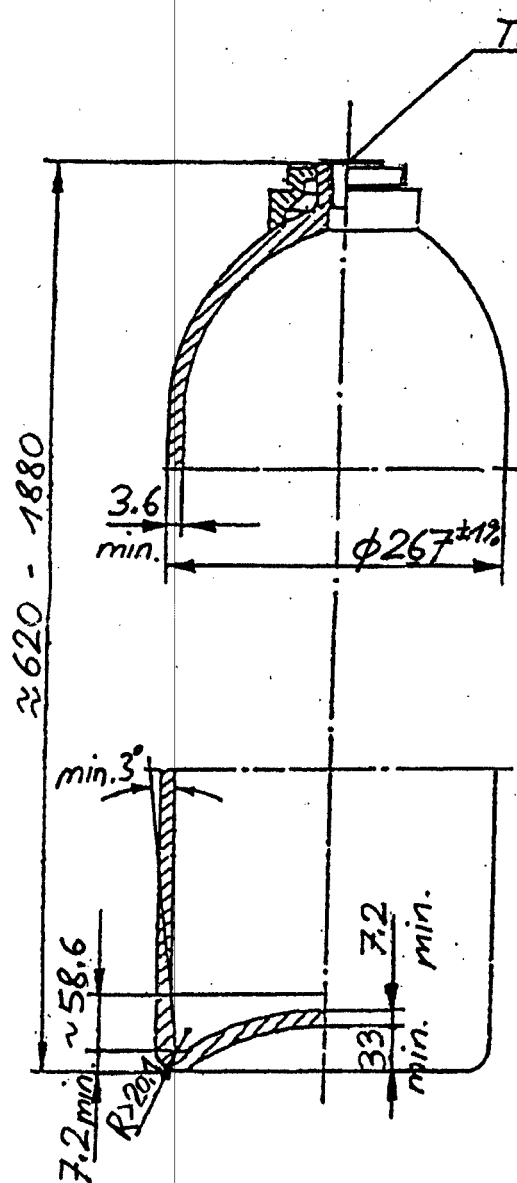
7. PACKAGING AND SAFETY CONTROLL MEASURES. Packaging prescribed is a non-DOT specification steel cylinder made in accordance with International Standard ISO-9809-2 (2002-06-15) and in accordance with Worthington Cylinders GmbH drawings numbers, N2500 - N9100 267 36 11, N3000 - N10000 280 38 11 and N3000 - N9900 280 51 11 (copies attached): except that markings shall be in accordance

with 49 CFR 178.35 (f); except that DOT-E XXXX shall be used in lieu of DOT-3A 1800.

8. MODES OF TRANSPORTATION AUTHORIZED. Motor vehicle, rail freight, cargo vessel, cargo-only aircraft.
9. SPECIAL PROVISIONS.
 - a. REPORTS. Prior to the initial shipment of cylinders made to any specification, an "Inspection Report", for the first production lot shall be submitted to the DOT / OHM. The manufacturer of the cylinders shall retain the reports as required by 178.35 (h).
 - b. Shippers may use the packaging covered by this exemption pursuant to 49 CFR 173.22 (a).
 - c. Filling limits specified in 49 CFR 173.302 (c) are not authorized. The filling pressure limit shall be the marked service pressure at 70°F.
 - d. Each cylinder must be requalified for use every ten years in accordance with 173.34 (e) (16).
 - e. A copy of this exemption must be carried aboard each vessel or aircraft used to transport package covered by this exemption.
10. REPORTING REQUIREMENTS. Any incident involving loss of contents of the package must be reported to DOT/OHM as soon as practicable.
11. EXPIRATION DATE. Proposed to be unlimited or until ISO-9809-2 is authorized under the UN Regulations.

Associate Director for
Hazardous Materials Regulations

(Date)



Threaded to customer's requirement

Wall Thickness

$$\alpha = \frac{D}{2} \left[1 - \sqrt{\frac{10 \cdot F \cdot Re - \sqrt{3} \cdot Ph}{10 \cdot F \cdot Re}} \right] = 3.57 \text{ mm}$$

$a_{\min} = 3.6 \text{ mm}$ (actual guaranteed minimum)

$$F = \frac{0,65}{(Re/Rg)} = 0,746$$

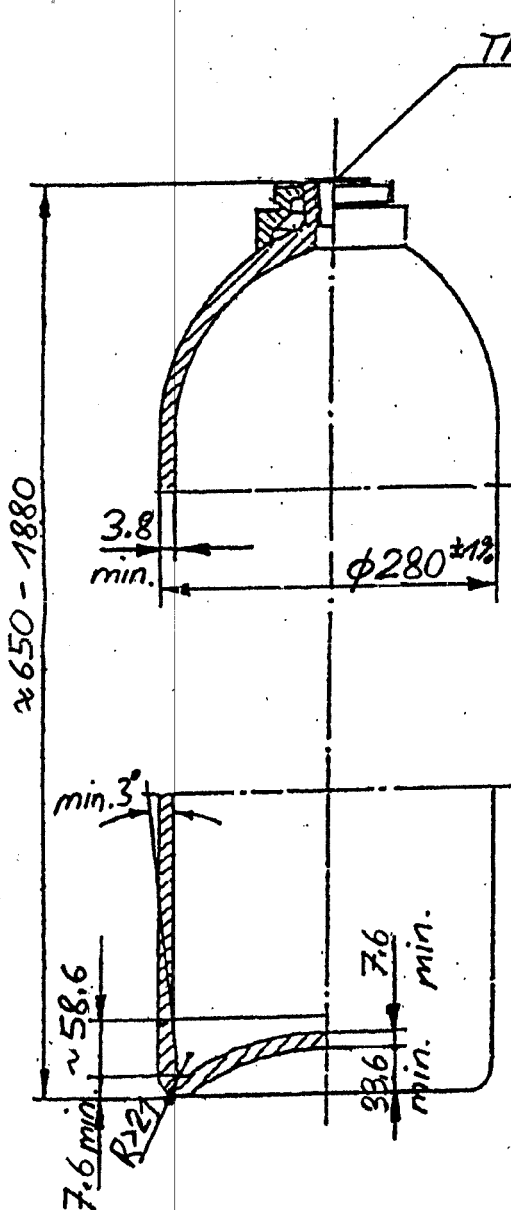
+)
Permanent and liquified gases (except H_2 , CO and mixtures thereof)

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Worthington Cylinders GmbH

A-3291 Kienberg b. Gaming, Austria

Specification ISO 9809-2	Material CrMo-Steel „VCL“ Heat treatment quenched and tempered	Yield point (R_e) min. 990 N/mm ²	
		U.T.S. (R_g) min. 1135-1220 N/mm ²	
Type EXTRA-5	Chemical composition		Elongation min. 12 % (L=5,85 √S ₀)
Name of gas +)	C 0,32-0,37 %	S ≤ 0,010 %	Impact value cross A-value 30 J/cm ² 150-V -50°C B-value 40 J/cm ²
Water capacity 25-91 l	Mn 0,60-0,80 %	Cr 0,95-1,15 %	
Filling weight — kg	Si 0,20-0,35 %	Mo 0,17-0,27 %	Drawn Amend Rev.1 Rev.2 Rev.3
Working pressure (P_B)(P_W) ≤ 150 bar	P ≤ 0,015 %	P+S ≤ 0,020 %	M Name
Test pressure (P_T)(P_H) 225 bar	V+Nb+Ti+B+Zr ≤ 0,15 %		10.11.03 Date
Weight empty ≈ 30-70 kg	Replaced by drw.no.		Checked
Notes Manufacturer's process: from billet Burst pressure $P_B \geq 360$ bar; Yield pressure $P_Y \geq 302$ bar		Drw.no. N2500-N9100 267 36 11	



Threaded to customer's requirement

Wall Thickness

$$\alpha = \frac{D}{2} \left[1 - \sqrt{\frac{10 \cdot F \cdot Re - \sqrt{3} \cdot Ph}{10 \cdot F \cdot Re}} \right] = 3.74 \text{ mm}$$

$a_{\min} = 3.8 \text{ mm}$ (actual guaranteed minimum)

$$F = \frac{0.65}{(Re/Rg)} = 0.746$$

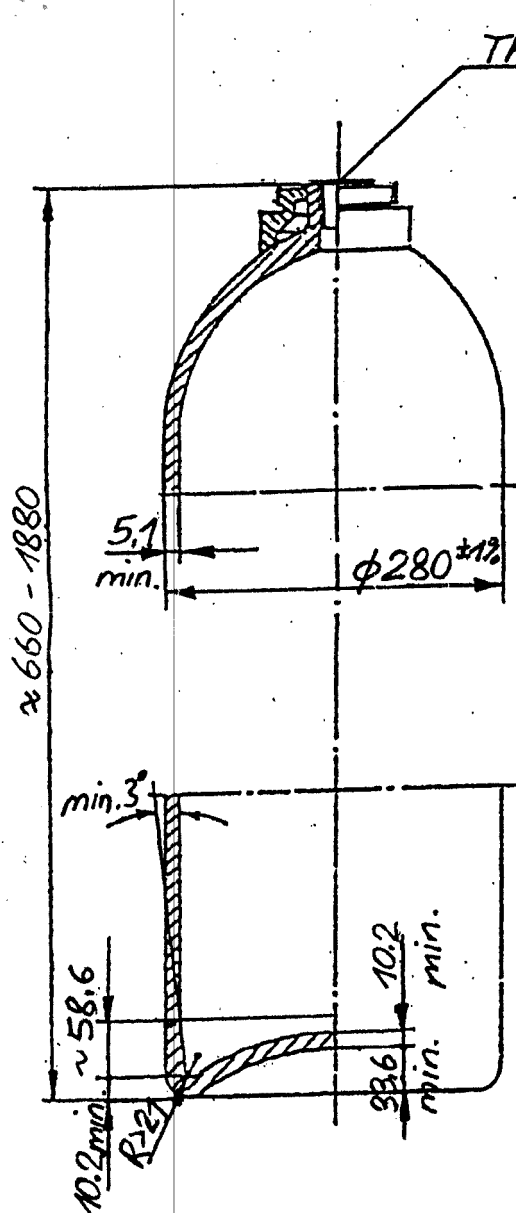
+) Permanent and liquified gases (except H_2 , CO and mixtures thereof)

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Threaded to customer's requirement

Wall Thickness

$$\alpha = \frac{D}{2} \left[1 - \sqrt{\frac{10 \cdot F \cdot Re - \sqrt{3} \cdot Ph}{10 \cdot F \cdot Re}} \right] = 5,01 \text{ mm}$$

$\alpha_{min} = 5.1 \text{ mm}$ (actual guaranteed minimum)

$$F = \frac{0,65}{(Re/Rg)} = 0,746$$

+) Permanent and liquified gases (except H_2 , CO and mixtures thereof)

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Worthington Cylinders GmbH

A-3291 Kienberg b. Gaming, Austria

Specification	Material CrMo-Steel "VCL"	Yield point (Re) min. 990 N/mm ²
1509809-2	Heat treatment quenched and tempered	U.T.S. (R _g) min. 1135-1220 N/mm ²
Type EXTRA-5	Chemical composition	Elongation min. 12 % (L ₀ 5,65 √ 50)
Name of gas +)	C 0,32 - 0,37 % S ≤ 0,010 %	Impact value cross A-value 35 J/cm ²
Water capacity 30 - 99 l	Mn 0,60 - 0,80 % Cr 0,95 - 1,15 %	150-V -50°C B-value 50 J/cm ²
Filling weight — kg	Si 0,20 - 0,35 % Mo 0,17 - 0,27 %	Drawn Amend Rev.1 Rev.2 Rev.3
Working pressure (P ₂) (P _m) ≤ 200 bar	P ≤ 0,015 % P+S ≤ 0,020 %	Name
Test pressure (P ₂) (P _t) 300 bar	V+Nb+Ti+B+Zr ≤ 0,15 %	10.11.09 Date
Weight empty ≈ 37 - 90 kg	Replaced by drw. no.	Checked
Notes Manufacturer's process: from billet	Drw. no.	N3000-N99002805111
Burst pressure P _b ≥ 480 bar; Yield pressure P _y ≥ 403 bar		